

(Time 3 Hours)

[Total marks: 80]

NB: 1) Question number 1 is compulsory**2) Answer any three questions out of remaining questions****3) Answer the questions with suitable diagrams****4) Assume suitable data wherever necessary**

- 1 Answer any Five- 20
- Why the 'Earth sensors' are not used for sensing the 'Yaw' axis in GEO satellites?
 - Why a multi-beam antenna is used in satellite communication?
 - For the same area of solar array which configuration, spin stabilization or body stabilization, generate more power. Justify.
 - Differentiate between window & frame organization.
 - Why LNA in a satellite receiving system is placed at the antenna end of the feeder cable?
 - Explain with diagram what is "Umbra" and "penumbra"? How it is affecting satellite operation?
- 2 (a) What are the different antenna tracking techniques of geostationary satellite? 10
- (b) Discuss in detail Telemetry, tracking and command with necessary block diagram. 10
- 3 (a) What are the main considerations in the design of an earth station? And how the earth stations are classified? 10
- (b) Explain the need of placing LNA next to Antenna, Calculate over all C/N Ratio for satellite if $[C/N]$, uplink = 25db & $[C/N]$, downlink = 20db Intermodulation Noise = 12db 10
- 4 (a) Discuss Design Consideration of Earth station, Draw the block diagram for Transmit and receive earth station and explain. 10
- (b) Compare Pre- assigned FDMA and Demand assigned FDMA 05
- (c) Explain TDMA frame structure. 05
- 5 (a) Explain on board connectivity with Transparent processing. 10
- (b) Discuss OSI Model for satellites Network also discuss layering principle. 05
- (c) Why TWT amplifier is Preferred for satellite communication? 05
- 6 Write short notes on any Four- 20
- Optical satellite Transmitter and receiver
 - Comparison of DS-CDMA, FH-CDMA and TH-CDMA.
 - Launching Mechanism
 - Reliability and space qualification test
 - VSAT